What is claimed is:

1. An arrayed waveguide grating comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides; and

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides.

2. An arrayed waveguide grating comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides; and

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides depending on the differences between optical losses along respective paths in the output slab waveguide.

3. An arrayed waveguide grating comprising:

a plurality of input waveguides for inputting signal lights having different wavelengths each other;

one or plural output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteris-

tics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides.

4. An arrayed waveguide grating comprising:

a plurality of input waveguides for inputting signal lights having different wavelengths each other;

one or plural output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide.

5. An arrayed waveguide grating comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides; and

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, said output slab waveguide having a core layer disposed therein for propagating light therethrough, said core layer being partly cut off in selected or all paths therein which interconnect said channel waveguide array and said output waveguides, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions in the paths having cut lengths set to predetermined values in the direction in which the signal lights propagate, depending on optical losses of the signal lights propagated in the paths.

6. An arrayed waveguide grating comprising:

a plurality of input waveguides for inputting signal lights having different wavelengths each other;

one or plural output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, said input slab waveguide having a core layer disposed therein for propagating light therethrough, said core layer being partly cut off in selected or all paths therein which interconnect said channel waveguide array and said input waveguides, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions in the paths having cut lengths set to predetermined values in the direction in which the signal lights propagate, depending on optical losses of the signal lights propagated in the paths.

7. An arrayed waveguide grating comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights, said output waveguides having at

least one core layer disposed therein for propagating light therethrough, said core layer being partly cut off, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions having cut lengths set to predetermined values depending on optical losses of the signal lights propagated in the output waveguides;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides; and

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides.

8. An arrayed waveguide grating comprising:

a plurality of input waveguides for inputting signal lights having different wavelengths each other, said input waveguides having at least one core layer disposed therein for propagating light therethrough, said core layer being partly cut off, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions having cut lengths set to predetermined values depending on optical

losses of the signal lights propagated in the input waveguides;

one or plural output waveguides for outputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides; and

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides.

9. An arrayed waveguide grating comprising:

one or plural input waveguides for inputting signal lights;

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides;

an output slab waveguide connecting an output end of said channel waveguide array to said input end thereof; and

a plurality of output waveguides having respective ends connected to the output end of said output slab waveguide, wherein selected or all of said ends of the output waveguides have respective central positions displaced from corresponding focused positions in a direction perpendicular to central axes of the output waveguides by predetermined values depending on losses to be given to the signal lights propagated in said output waveguides.

10. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural output waveguides for outputting signal lights;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

a plurality of input waveguides having respective ends connected to the input end of said input slab waveguide, wherein selected or all of said ends of the input waveguides have respective central positions dis-

placed from corresponding focused positions in a direction perpendicular to central axes of the input waveguides by predetermined values depending on losses to be given to the signal lights propagated in said input waveguides.

11. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural input waveguides for inputting signal lights, said input waveguides having output ends connected to an input end of said input slab waveguide;

an output slab waveguide having an input end connected to an output end of said channel waveguide array; and

a plurality of output waveguides having respective ends connected to the output end of said output slab waveguide, wherein selected or all of central axes of said output waveguides are inclined at the interconnected points of the output waveguides and said output slab waveguide at respective angles depending on losses

to be given to the signal lights coupled at said interconnected points.

12. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural output waveguides for outputting signal lights;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

a plurality of input waveguides having respective ends connected to the input end of said input slab waveguide, wherein selected or all of central axes of said input waveguides are inclined at the interconnected points of the input waveguides and said input slab waveguide at respective angles depending on losses to be given to the signal lights coupled at said interconnected points.

13. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural input waveguides for inputting signal lights, said input waveguides having output ends connected to an input end of said input slab waveguide;

an output slab waveguide having an input end connected to an output end of said channel waveguide array; and

a plurality of output waveguides having respective ends connected to the output end of said output slab waveguide, wherein selected or all widths of the output waveguides at ends thereof are set to predetermined values depending on losses to be given to the signal lights.

14. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural output waveguides for outputting signal lights;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

a plurality of input waveguides having respective ends connected to the input end of said input slab waveguide, wherein selected or all widths of the input waveguides at ends thereof are set to predetermined values depending on losses to be given to the signal lights.

15. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural input waveguides for inputting signal lights, said input waveguides having output ends connected to an input end of said input slab waveguide;

an output slab waveguide having an input end connected to an output end of said channel waveguide array; and

a plurality of output waveguides having respective ends connected to the output end of said output

slab waveguide, wherein the lengths between the ends of the output waveguides and said channel waveguide array are displaced in the direction of propagation axes of the output waveguides depending on losses to be given to the signal lights propagated from said channel waveguide array to the ends of the output waveguides.

16. An arrayed waveguide grating comprising:

a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences;

an input slab waveguide having an output end connected to an input end of said channel waveguide array;

one or plural output waveguides for outputting signal lights;

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides; and

a plurality of input waveguides having respective ends connected to the input end of said input slab waveguide, wherein the lengths between the ends of the input waveguides and said channel waveguide array are displaced in the direction of propagation axes of the input waveguides depending on losses to be given to the

signal lights propagated from said channel waveguide array to the ends of the input waveguides.

17. A demultiplexer comprising:

an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, said output slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides; and

level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values.

18. A demultiplexer comprising:

an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a

plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, said output slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides depending on the differences between optical losses along respective paths in the output slab waveguide; and

level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values.

19. A multiplexer comprising:

a plurality of light sources;

an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths each other, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively

longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, said input slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides;

level detecting means for detecting levels of the signal lights input from said light sources to said arrayed waveguide grating; and

level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective wavelengths, and adjusting output levels of said light sources to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values.

20. A multiplexer comprising:

a plurality of light sources;

an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths each other, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences,

an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, said input slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide; level detecting means for detecting levels of the signal lights input from said light sources to said arrayed waveguide grating; and

level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective wavelengths, and adjusting output levels of said light sources to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values.

21. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path and having an arrayed waveguide grating;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths from said light source, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides.

22. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path and having an arrayed waveguide grating;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of

output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides depending on the differences between optical losses along respective paths in the output slab waveguide.

23. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a first arrayed waveguide grating for demultiplexing a wavelength-division multiplexed optical signal into optical signals of respective wavelengths, and a second arrayed waveguide grating for wavelength-division multiplexing the demultiplexed optical signals of respective wavelengths;

said first arrayed waveguide grating comprising one or plural input waveguides for inputting signal

lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides;

said second arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths each other, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides.

24. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a first arrayed waveguide grating for demultiplexing a wavelength-division multiplexed optical signal into optical signals of respective wavelengths, and a second arrayed waveguide grating for multiplexing the demultiplexed optical signals of respective wavelengths;

said first arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides depending on the differences between optical losses along respective paths in the output slab waveguide;

said second arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths each other, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide.

25. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising an arrayed waveguide grating having a plurality of input waveguides for inputting signal lights having different wavelengths, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides; level detecting means for detecting levels of the signal lights input to said arrayed waveguide grating; and level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the

termined levels for the respective wavelengths, and adjusting output levels of the light signals to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides; and level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values.

26. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having op-

tical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide; level detecting means for detecting levels of the signal lights input to said arrayed waveguide grating; and level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective wavelengths, and adjusting output levels of the signal lights to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides depending on the differences between optical losses along respective paths in

the output slab waveguide; and level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values.

27. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a demultiplexer for demultiplexing a wavelength-division multiplexed optical signal into optical signals of respective wavelengths, and a multiplexer for wavelength-division multiplexing the demultiplexed optical signals of respective wavelengths;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said

channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides; and level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values;

said multiplexer comprising an arrayed waveguide grating having a plurality of input waveguides for inputting signal lights having different wavelengths, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides; level detecting means for detecting levels of the signal lights input to said arrayed waveguide grating; and level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective wavelengths, and adjusting output levels of

justing output levels of the light signals to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values.

28. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a demultiplexer for demultiplexing a wavelength-division multiplexed optical signal into optical signals of respective wavelengths, and a multiplexer for frequency-division multiplexing the demultiplexed optical signals of respective wavelengths;

said demultiplexer comprising an arrayed waveguide grating comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and having optical input/output characteristics set to predetermined ratios for the respective output waveguides with

respect to said input waveguides depending on the differences between optical losses along respective paths in the output slab waveguide; and level adjusting means for being supplied with the signal lights of respective wavelengths from the output waveguides of said arrayed waveguide grating, and adjusting output levels of said signal lights to desired values;

said multiplexer comprising an arrayed waveguide grating comprising a plurality of input waveguides for inputting signal lights having different wavelengths, one or plural output waveguides for outputting signal lights, a channel waveguide array having waveguides which are successively longer with predetermined waveguide length differences, an output slab waveguide connecting an output end of said channel waveguide array to said output waveguides, and an input slab waveguide connecting an input end of said channel waveguide array to said input waveguides, and having optical input/output characteristics set to predetermined ratios for the respective input waveguides corresponding to the output waveguides depending on the differences between optical losses along respective paths in the output slab waveguide; level detecting means for detecting levels of the signal lights input to said arrayed waveguide grating; and level adjusting means for comparing the levels of the signal lights detected by said level detecting

means with predetermined levels for the respective wavelengths, and adjusting output levels of the signal lights to set the levels of the waveguides multiplexed by said arrayed waveguide grating to desired values.

29. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights; and

a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to the input waveguides.

30. A waveguide device comprising:

a plurality of input waveguides for inputting signal lights;

one or plural output waveguides for outputting signal lights; and

a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides.

31. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a plurality of output waveguides for outputting signal lights; and

a slab waveguide connecting the input waveguides to the output waveguides, said slab waveguide having a core layer disposed therein for propagating light therethrough from said input waveguides to the output waveguides, said core layer being partly cut off in selected or all paths therein which interconnect said input waveguides and said output waveguides, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions in the paths having cut lengths set to predetermined values in the direction in which the signal lights propagate, depending on optical losses of the signal lights propagated in the paths.

32. A waveguide device comprising:

a plurality of input waveguides for inputting signal lights;

one or plural output waveguides for outputting signal lights; and

a slab waveguide connecting the input waveguides to the output waveguides, said slab waveguide having a core layer disposed therein for propagating

light therethrough from said input waveguides to the output waveguides, said core layer being partly cut off in selected or all paths therein which interconnect said input waveguides and said output waveguides, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions in the paths having cut lengths set to predetermined values in the direction in which the signal lights propagate, depending on optical losses of the signal lights propagated in the paths.

33. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a slab waveguide having an input end connected to said input waveguides; and

an output waveguide having a plurality of waveguides connected to an output end of said slab waveguide, wherein each of selected or all of the waveguides have a core layer disposed therein for propagating light therethrough, said core layer being partly cut off, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions having cut lengths set to predetermined values depending on optical losses of the signal lights propagated in the waveguides.

34. A waveguide device comprising:

an input waveguide having a plurality of waveguides for inputting signal lights, wherein each of selected or all of the waveguides have a core layer disposed therein for propagating light therethrough, said core layer being partly cut off, and a cladding layer disposed in cut regions of the core layer and on opposite sides of the core layer, said cut regions having cut lengths set to predetermined values depending on optical losses of the signal lights propagated in the waveguides;

one or plural output waveguides for outputting signal lights; and

a slab waveguide interconnecting said input waveguides and said output waveguides.

35. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a slab waveguide having an input end connected to output ends of said input waveguides; and

an output waveguide having a plurality of waveguides connected to an output end of said slab waveguide, wherein selected or all of the waveguides have ends having respective central positions displaced from corresponding focused positions in a direction perpen-

dicular to central axes of the waveguides by predetermined values depending on losses to be given to the signal lights propagated in said waveguides.

36. A waveguide device comprising:

a slab waveguide;

an output waveguide connected to an output end of said slab waveguide; and

a plurality of input waveguides having respective ends connected to an input end of said slab waveguide, wherein selected or all of said ends have respective central positions displaced from corresponding focused positions in a direction perpendicular to central axes of the input waveguides by predetermined values depending on losses to be given to the signal lights propagated in said output waveguides.

37. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a slab waveguide having an input end connected to output ends of said input waveguides; and

a plurality of output waveguides having respective ends connected to an output end of said slab waveguide, wherein selected or all of central axes of said output waveguides are inclined at the interconnected

points of the output waveguides and said slab waveguides at respective angles depending on losses to be given to the signal lights coupled at said interconnected points.

38. A waveguide device comprising:

one or plural output waveguides for outputting signal lights;

a slab waveguide having an output end connected to input ends of said output waveguides; and

a plurality of input waveguides having respective ends connected to an input end of said slab waveguide, wherein selected or all of central axes of said input waveguides are inclined at the interconnected points of the input waveguides and said slab waveguides at respective angles depending on losses to be given to the signal lights coupled at said interconnected points.

39. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a slab waveguide having an input end connected to output ends of said input waveguides; and

a plurality of output waveguides having respective ends connected to an output end of said slab waveguide, wherein selected or all of said ends have

waveguide widths set to values depending on losses to be given to the signal lights.

40. A waveguide device comprising:

one or plural output waveguides for outputting signal lights;

a slab waveguide having an output end connected to input ends of said output waveguides; and

a plurality of input waveguides having respective ends connected to an input end of said slab waveguide, wherein selected or all of said ends have waveguide widths set to values depending on losses to be given to the signal lights.

41. A waveguide device comprising:

one or plural input waveguides for inputting signal lights;

a slab waveguide having an input end connected to output ends of said input waveguides; and

a plurality of output waveguides having respective ends connected to an output end of said slab waveguide, wherein the lengths between the ends of the output waveguides and said input waveguides are displaced in the direction of propagation axes of the output waveguides depending on losses to be given to the signal

lights propagated from said input waveguides to the ends of the output waveguides.

42. A waveguide device comprising:

one or plural output waveguides for outputting signal lights;

a slab waveguide having an output end connected to input ends of said output waveguides; and

a plurality of input waveguides having respective ends connected to an input end of said slab waveguide, wherein the lengths between the ends of the output waveguides and said input waveguides are displaced in the direction of propagation axes of the output waveguides depending on losses to be given to the signal lights propagated from said output waveguides to the ends of the input waveguides.

43. A demultiplexer comprising:

a waveguide device having one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to the input waveguides; and

level adjusting means for being supplied with signal lights output from the output waveguides of said

waveguide device, and adjusting output levels of the signal lights to desired values.

44. A multiplexer comprising:

a plurality of light sources for respective signals;

a waveguide device having a plurality of input waveguides for inputting signal lights, one or plural output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides;

level detecting means for detecting levels of the signal lights input from said light sources to said waveguide device; and

level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective signal lights, and adjusting output levels of the respective signal lights to set the levels of the signal lights wavelength-division multiplexed by said waveguide device to desired values.

45. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path and having a waveguide device;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising a plurality of input waveguides for inputting signal lights, one or plural output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides;

said demultiplexer comprising a waveguide device comprising one or plural input waveguides for input-

ting signal lights, a plurality of output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides.

46. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a first waveguide device for demultiplexing a wavelength-division multiplexed optical signal into optical signals of respective wavelengths, and a second waveguide device for wavelength-division multiplexing the demultiplexed optical signals of respective wavelengths;

said first waveguide device comprising one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to said input waveguides;

said second waveguide device comprising a plurality of input waveguides for inputting signal lights,

one or plural output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides.

47. An optical communication system comprising:

optical transmitting means for transmitting optical signals of respective wavelengths parallel to each other;

a multiplexer for wavelength-division multiplexing the optical signals of respective wavelengths transmitted by said light transmitting means;

an optical transmission path for transmitting a wavelength-division multiplexed optical signal output from said multiplexer;

a node disposed in said optical transmission path;

a demultiplexer for being supplied with the optical signal transmitted over said optical transmission path via said node and demultiplexing the optical signal into the optical signals of respective wavelengths; and

optical receiving means for receiving the optical signals of respective wavelengths demultiplexed by said demultiplexer;

said multiplexer comprising a plurality of light sources for respective signals, a waveguide device having a plurality of input waveguides for inputting signal lights, one or plural output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides; level detecting means for detecting levels of the signal lights input from said light sources to said waveguide device; and level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective signal lights, and adjusting output levels of the respective signal lights to set the levels of the signal lights multiplexed by said waveguide device to desired values;

said demultiplexer comprising a waveguide device having one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to the input waveguides; and level adjusting means for being supplied with the signal lights from the output waveguides of said waveguide device, and adjusting output levels of said signal lights to desired values.

48. An optical communication system comprising:

an annular transmission path having a plurality of nodes interconnected in a ring by a transmission path, for transmitting a wavelength-division multiplexed optical signal over the transmission path;

each of said nodes having a demultiplexer for demultiplexing a multiplexed optical signal into optical signals of respective wavelengths, and a multiplexer for wavelength-division multiplexing the demultiplexed optical signals of respective wavelengths;

said demultiplexer comprising a waveguide device having one or plural input waveguides for inputting signal lights, a plurality of output waveguides for outputting signal lights, and a slab waveguide having optical input/output characteristics set to predetermined ratios for the respective output waveguides with respect to the input waveguides; and level adjusting means for being supplied with the signal lights from the output waveguides of said waveguide device, and adjusting output levels of said signal lights to desired values; and

said multiplexer comprising a plurality of light sources for respective signals, a waveguide device having a plurality of input waveguides for inputting signal lights, one or plural output waveguides for outputting signal lights, and a slab waveguide having optical

input/output characteristics set to predetermined ratios for the respective input waveguides with respect to the output waveguides; level detecting means for detecting levels of the signal lights input from said light sources to said waveguide device; and level adjusting means for comparing the levels of the signal lights detected by said level detecting means with predetermined levels for the respective signal lights, and adjusting output levels of the respective signal lights to set the levels of the signal lights multiplexed by said waveguide device to desired values.

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